



West Lake Landfill: HQ/NRRB review of SSFS Work Plans

Dan Gravatt to: Stuart Walker, David Bartenfelder, Ron Wilhelm,
Charles Openchowski

12/12/2012 01:36 PM

Cc: Doug Ammon

Stuart, Dave, Ron, Charles,

See email string below from Doug Ammon on HQ review of the West Lake SSFS work plans. We have four of them so far, attached below in case they have not already been provided to you. I anticipate two more and will forward them as they arrive from the PRP's contractor. I am also attaching EPA's letter to the PRPs requesting this work for the SSFS for your reference. Please advise when you believe you can complete your reviews and provide comments.

Sincerely,

Daniel R. Gravatt, PG
US EPA Region 7 SUPR / MOKS
11201 Renner Boulevard, Lenexa, KS 66219
Phone (913) 551-7324

Principles and integrity are expensive, but they are among the very few things worth having.



Work Plan- Alternative Area 2 RIM Volume.pdf Work Plan - Apatite Technology.pdf Work Plan - Discount Rate.pdf



Work Plan - Partial Excavation 12-4-12.pdf Additional Work letter to PRPs for SSFS.pdf

----- Forwarded by Dan Gravatt/R7/USEPA/US on 12/12/2012 01:29 PM -----

From: DeAndre Singletary/SUPR/R7/USEPA/US
To: Doug Ammon/DC/USEPA/US@EPA
Date: 12/11/2012 02:19 PM
Subject: Re: West Lake Landfill: SSFS Partial Excavation Work Plan

Thank you so much Doug. I am really appreciative of your effort here.

Thanks,
DeAndré D. Singletary, Chief
Missouri / Kansas Remedial Branch
Superfund Division
U.S. EPA
11201 Renner Blvd., Lenexa, KS 66219
Office (913) 551-7373
Fax (913) 551-9373

Doug Ammon

I have requested review of the 4 work plans to th...

12/11/2012 01:43:39 PM

From: Doug Ammon/DC/USEPA/US
To: DeAndre Singletary/SUPR/R7/USEPA/US@EPA
Date: 12/11/2012 01:43 PM
Subject: Re: West Lake Landfill: SSFS Partial Excavation Work Plan

I have requested review of the 4 work plans to this group and also to Charles Openchowski.
DCA sent by Blackberry

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Superfund

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0W01

DeAndre Singletary Doug, I was wondering if the HQ technical re...

12/11/2012 02:40 PM EST

From: DeAndre Singletary
To: Doug Ammon
Cc:
Date: 12/11/2012 02:40 PM EST
Subject: Fw: West Lake Landfill: SSFS Partial Excavation Work Plan

Doug,

I was wondering if the HQ technical review team had been established so that Dan could send this information to them directly? My recollection is that Stuart Walker, Dave Bartenfelder, and Ron Wilhelm were going to be a part of that team. Let me know. Thanks!

DeAndré D. Singletary, Chief
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----- Forwarded by DeAndre Singletary/SUPR/R7/USEPA/US on 12/11/2012 01:32 PM -----

From: Dan Gravatt/R7/USEPA/US
To: Amy Legare/DC/USEPA/US@EPA
Cc: DeAndre Singletary/SUPR/R7/USEPA/US@EPA, Audrey Asher/R7/USEPA/US@EPA, Craig Smith/SUPR/R7/USEPA/US@EPA, Doug Ammon/DC/USEPA/US@EPA, Charles Openchowski/DC/USEPA/US@EPA
Date: 12/05/2012 07:13 AM
Subject: West Lake Landfill: SSFS Partial Excavation Work Plan

Amy,

Here is the next workplan provided by the West Lake OU1 PRPs for the additional evaluations requested by the NRRB. Since these additional evaluations are being conducted solely to respond to the Board's comments, it is essential that the Board review these work plans to ensure that the proposed work will adequately address the Board's comments, and to ensure that this is the final set of additional evaluations to be conducted prior to drafting the ROD amendment.

Please have the Board review and comment on this work plan and the others I previously forwarded to you, and I will pass the Board's comments on to the PRPs so they can make any necessary changes. While the Region may provide its own comments to the PRPs on these work plans, the Region will not consider these work plans to be final until it receives the Board's comments (and the PRPs address those comments to the Board's satisfaction) or the Board informs the Region that the work plans are acceptable. As the PRPs provide the remaining work plans, I will forward them to you for the Board's review.

Sincerely,
Daniel R. Gravatt, PG
US EPA Region 7 SUPR / MOKS
11201 Renner Boulevard, Lenexa, KS 66219
Phone (913) 551-7324

Principles and integrity are expensive, but they are among the very few things worth having.

----- Forwarded by Dan Gravatt/R7/USEPA/US on 12/05/2012 06:54 AM -----

From: "Paul Rosasco" <paulrosasco@emsidenver.com>
To: Dan Gravatt/R7/USEPA/US@EPA, Audrey Asher/R7/USEPA/US@EPA
Cc: "Muenks, Shawn" <shawn.muenks@dnr.mo.gov>, "Merrigan, Jessie \\\(LG\\)"
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Bollenbacher" <mikeb@auxier.com>, "Bob Jelinek" <bobjelinek@emsidenver.com>
Date: 12/04/2012 03:20 PM
Subject: Partial Excavation Work Plan

Attached please find the Work Plan for development and evaluation of a Partial Excavation Alternative.
[attachment "Work Plan - Partial Excavation 12-4-12.pdf" deleted by Doug Ammon/DC/USEPA/US]

Work Plan

Alternative Area 2 Excavation Depths and Volumes

Introduction

EPA's October 12, 2012 letter to the West Lake Landfill Operable Unit 1 (OU-1) Respondents states that, during an early consultation with the National Remedy Review Board (NRRB), the NRRB indicated that the deeper radiological detections in borings WL-210 and WL-235 are unreliable. Consequently, EPA has asked that the volume of radiologically-impacted material (RIM) considered for possible excavation under the "complete rad removal" alternatives be revised to exclude deeper intervals in soil borings WL-210 and WL-235 in Area 2.

Evaluation of the soil sample analytical results and the downhole gamma logging data during preparation of the SFS indicated that soil containing radionuclides above the levels used to identify material to be included within the scope of the two "complete rad removal" alternatives was potentially present within a deeper depth interval beneath the southwestern portion of Area 2. Specifically, elevated gamma peaks were identified on the downhole gamma logs at depths of 47.5 feet (ft) below ground surface (bgs) in WL-210 and 22.5 ft bgs in WL-235; however, the Remedial Investigation (RI) [EMSI, 2000] states (on p. 97) that boring WL-210 was re-logged because during the first logging attempt, material was knocked into the hole and that the presence of this material may have been the cause of a small poorly defined peak at the bottom of this boring. The RI also states (again on p. 97) that the presence of a poorly defined peak at the bottom of WL-235 may also be the result of RIM at shallow depths having been knocked into this borehole during drilling or logging activities.

Although the RI raised possible questions about the representativeness of the downhole gamma logs for the deeper intervals of these two borings, a soil sample obtained from boring WL-210 detected the presence of total Thorium-230+232 at a depth of 40 ft bgs at a level (18.6 pCi/g) above the cleanup level (7.9 pCi/g) used to evaluate potential excavation alternatives. A duplicate sample obtained from this same depth interval contained total thorium at 11.6 pCi/g. These samples were obtained from a depth of 40 ft, 10 feet above the bottom of the borehole. In addition, these samples were obtained during drilling of the borehole, prior to the downhole logging activities that may have resulted in surficial material being knocked into the hole. Therefore, these sample results likely represent actual conditions at the 40 ft depth interval in boring WL-210. The RI sampling did not include collection of a soil sample from the deeper portion of the WL-235.

Although uncertainty exists regarding the representativeness of the downhole gamma logs at these two locations, the soil sample result from the 40 ft depth in WL-210 combined with the downhole gamma logs were used to define an area and volume of a deeper interval of RIM occurrence beneath the southwestern portion of Area 2. This material and the associated overburden material that would need to be removed to allow for excavation of this RIM, were included within the overall volumes of materials that would need to be excavated if one of the "complete rad removal" alternatives were to be

implemented at the site. (Note: Deeper intervals of radiologically-impacted material were also identified beneath other portions of Area 2 but are not the subject of this re-evaluation).

Because of the uncertainty associated with the downhole gamma logging at these two locations, EPA has indicated that the NRRB believes the radiological detections in the deeper portions of these two borings are unreliable. EPA has therefore requested that the volumes of materials that may be removed under a "complete rad removal" alternative be re-estimated to exclude the deeper depth intervals in borings WL-210 and WL-235.

Approach

The following approach will be used to develop a revised excavation volume for Area 2:

1. Revise the calculated volume of material to be excavated under the "complete rad removal" alternatives to eliminate deeper intervals in soil borings WL-210 and WL-235 and consequently to eliminate removal of the deeper interval of RIM material from the southwestern portion of Area 2; and
2. Develop revised estimates of the potential risks to workers and the public, revised projected construction schedules, and revised cost estimates for excavation and offsite or onsite disposal based on exclusion of the potential deeper occurrences of RIM beneath the southwestern portion of Area 2.

Deliverables

The following deliverables will be prepared pursuant to this task

1. Interim Deliverable – A brief memorandum will be prepared summarizing the revisions to the RIM extent and volumes resulting from exclusion of the deeper interval beneath the southwestern portion of Area 2. If the re-evaluation of the volume material results in significant changes in the amounts of materials that would be excavated under the "complete rad removal" alternatives, this memorandum will also include evaluations of potential risks, revised calculations of greenhouse gas emissions, revised anticipated project schedules, and revised anticipated costs for the two "complete rad removal" alternatives based on the assumption that the deeper intervals in borings WL-210 and WL-235 are not included in the volume of RIM material under the two "complete rad removal" alternatives.
2. SFS Revisions – The existing SFS text, tables and appendices will be amended to include the results of alternative development and evaluation based on exclusion of the deeper intervals in borings WL-210 and 235 in conjunction with the existing discussions that include these depth

intervals as presented in the current SFS report. Subject to EPA comments on the Interim Deliverable, the following specific revisions to the December 2011 SFS report are anticipated:

- a. Amend the text of the SFS as follows:
 - i. Section 5.3.1 – Include as part of the descriptions of the excavation and disposal alternatives the volumes of RIM and overburden material to be excavated if the reported deeper occurrences in borings WL-210 and WL-235 are not considered in addition to the total volumes already presented in this section
 - ii. Sections 6.2.2 and 6.2.3 – Include as part of the descriptions of the excavation and disposal alternatives the volumes of RIM and overburden material to be excavated if the reported deeper occurrences in borings WL-210 and WL-235 are not considered in addition to the total volumes already presented in this section
 - iii. Sections 6.2.2.5 and 6.2.3.5 – Add to the discussions of Short-Term Effectiveness, in particular the Protection of the Community, Protection of Workers, and Time Until RAOs are Achieved, discussions relative to the reduced volume of material and consequently reduced time frames that would be associated with excavation and disposal alternatives if the reported deeper occurrences in borings WL-210 and WL-235 are not considered
 - iv. Sections 6.2.2.7 and 6.2.3.7 – Add to the discussion of Cost, the estimated costs to implement the excavation and disposal alternatives based on the reduced volume of material and consequently reduced time frames that would be associated with excavation and disposal alternatives if the reported deeper occurrences in borings WL-210 and WL-235 are not considered
 - v. Sections 7.2.3 (Short Term Effectiveness) and 7.2.5 (Cost) – Revise the comparative analysis of alternatives to reflect the differences between the short-term risks, schedules and costs that result from inclusion or exclusion of the deeper intervals in borings WL-210 and WL-235
- b. Amend the Appendices to the SFS as follows:
 - i. Appendix B – Develop and include an alternative excavation plan that does not include excavation of the deeper intervals at WL-210 and WL-235 and calculate the revised volume of RIM and overburden material to be excavated.
 - ii. Appendix H – Develop and include estimates of the potential risks to the community and workers based on the volumes of RIM and overburden material to be excavated and revised construction schedules if the deeper intervals in borings WL-210 and WL-235 are not considered
 - iii. Appendix I – Prepare additional estimates of Greenhouse Gas Emissions associated with the “complete rad removal” alternatives under a scenario where the deeper intervals in borings WL-210 and WL-235 are not considered

- iv. Appendix J – Prepare additional construction schedules for the “complete rad removal” alternatives under a scenario where the deeper intervals in borings WL-210 and WL-235 are not considered
- v. Appendix J – Prepare additional estimates of the construction costs (both fiscally constrained and not-fiscally constrained) for the “complete rad removal” alternatives under a scenario where the deeper intervals in borings WL-210 and WL-235 are not considered

Clarifications by EPA

No additional information or clarifications are being requested from EPA at this time relative to this task.

Anticipated Schedule

It is anticipated that it will take approximately two months to develop the interim summary memorandum.

Preparation of a Supplemental SFS report that includes the results of the revised Area 2 excavation volumes and associated evaluations, as described in the interim deliverable summary memorandum, will be performed once EPA comments on the interim deliverable are received and in conjunction with revisions to the existing SFS report required to address the results of the various other additional tasks EPA has requested.

References

Engineering Management Support, Inc. (EMSI), 2011, Supplemental Feasibility Study, Radiologically-Impacted Material Excavation Alternative Analysis, West Lake Landfill Operable Unit-1, December 16.

EMSI, 2000, Remedial Investigation, West Lake Landfill Operable Unit-1, April 10.

Scope of Work and Schedule

Evaluation of the Use of Apatite/Phosphate Treatment Technologies

Introduction

EPA's October 12, 2012 letter indicated that the National Remedy Review Board recommended that more detailed evaluations of potential treatment technologies be conducted as part of a Supplement to the Supplemental Feasibility Study [SFS] (EMSI, 2011). Consequently, EPA has asked the Respondents to evaluate the potential application of apatite and/or phosphate solutions for possible treatment of waste materials and/or groundwater. EPA requested that this evaluation be performed at a level of detail comparable to that used to evaluate the treatment technologies previously analyzed in the SFS.

Approach

Typically, the first step in the identification of potentially applicable remedial technologies is to evaluate general response actions that, based on site conditions and media of concern, could address the remedial action objectives (RAOs) at a site. The RAOs developed for OU-1 did not include direct treatment of the waste materials or treatment of groundwater. Consequently, potential remedial technologies related to these response actions were not evaluated in the FS (EMSI, 2006) or the SFS (EMSI, 2011). For purposes of conducting an evaluation of potential apatite treatment technologies, this initial step, evaluation of general response actions based on site conditions and media of concern, will be skipped. Instead, to comply with EPA's direction, the evaluation will be based on a hypothetical scenario where treatment of the waste materials and/or treatment of groundwater have been deemed appropriate response actions relative to the site conditions and media of concern. In the event that apatite treatment technology is determined to potentially be applicable to OU-1, it may be necessary to revisit the evaluation of general response actions and the identification of other potentially applicable remedial technologies.

Evaluation of the potential applicability of apatite or other phosphate-based treatment technologies will be performed using the same approach used to evaluate other potential remedial technologies under a Feasibility Study level-of-effort. The first step will be to identify potential apatite/phosphate-based treatment technologies and perform an initial screening of the technical implementability of such technologies relative to the waste and site conditions. The anticipated approach to the evaluation of potential application of apatite treatment technology will be based on the following:

1. Review of available published literature; and
2. Discussions with DOE individuals with knowledge of the use and applicability of apatite injection technology.

Subject to results of the initial evaluations, possible applications of apatite/phosphate-based technologies to West Lake Landfill OU-1 may include the following:

1. Injection into waste materials to reduce leaching of radionuclides; and/or
2. Use for treatment of radionuclide occurrences in groundwater.

If the initial evaluations of potential apatite/phosphate-based treatment technologies indicate that such technologies may potentially be applicable to the site and waste conditions in OU-1, these technologies will be subjected to further evaluations including evaluations of potential effectiveness, implementability and cost in accordance with the procedures prescribed in EPA's "Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA" (EPA, 1988).

Results of Preliminary Evaluations

This section provides a summary of the results of initial evaluations completed prior to and during development of this scope of work. An initial search of technical literature (see References section below) and initial discussions with DOE personnel familiar with use of apatite-based technologies indicate the following:

1. Injection of apatite solution has been successful in halting migration of strontium-90 in groundwater at Hanford;
2. Bench-scale testing at Oak Ridge has indicated that apatite may be effective in treating uranium and heavy metals in groundwater (this reportedly was to be followed up by a pilot-scale test but reports of the results of the pilot-scale testing, if performed, have not yet been located);
3. No reports or information have yet been identified relative to the use of apatite to treat waste/source materials or relative to possible source treatment within a solid waste matrix; and
4. DOE representatives indicated that owing to the potential disruption in chemical equilibrium within the waste matrix, such an application could result in an increase in leaching potential of radionuclides instead of a reduction in leaching potential that would be intended by such an application.

Due to the lack of application of this technology for source stabilization, and in particular the complete lack of application to a source material composed of municipal solid waste, significant uncertainty exists relative to the potential applicability, effectiveness and possible unintended consequences of using apatite technology to attempt to reduce potential leaching of radionuclides from OU-1.

All published information identified to date relates to treatment of select radionuclides and heavy metals in groundwater. Specifically, the only published information located so far relative to treatment

of groundwater relates to treatment of strontium, uranium and heavy metals. No information exists regarding the potential use of apatite for treatment of radium or thorium.

Furthermore, EPA previously determined that there is no unacceptable risk of groundwater contamination at the site. Specifically, the ROD contains the following conclusions:

1. *These (groundwater sampling) results are not indicative of on-site contaminant plumes, radial migration, or other forms of contiguous groundwater contamination that might be attributable to the landfill units being investigated. (ROD at p. 20)*
2. *The groundwater results show no evidence of significant leaching and migration of radionuclides from Areas 1 and 2. (ROD at p. 21)*
3. *Significant leaching and migration of radionuclides to perched water or groundwater have not occurred despite landfilled waste materials having been exposed to worst-case leaching conditions from surface water infiltration over a period of decades. (ROD at p. 21)*
4. *The lack of radionuclide contamination in groundwater at the Site is consistent with the relatively low solubility of most radionuclides in water and their affinity to adsorb onto the soil matrix. (ROD at p. 21)*
5. *This pathway for migration (groundwater flow to the river) is not considered significant under current conditions because the on-site impact to groundwater from the landfill units is so limited. (ROD at p. 21)*
6. *The fourth (remedial action) objective (Collect and treat contaminated groundwater and leachate to contain any contaminant plume and prevent further migration from the source area) is not applicable because a plume of contaminated groundwater beneath or downgradient of the disposal areas has not been identified. (ROD at p. 30)*

Consequently, groundwater was not determined to be a media of concern (i.e., no plume of groundwater contamination exists) and treatment of groundwater was not identified as a potential response action for the site in the prior FS or SFS. Accordingly, groundwater treatment technologies were not evaluated in either the FS or SFS. If apatite technology were to be evaluated as a remedial alternative, it may be appropriate to also evaluate other possible groundwater treatment technologies.

Alternatively, apatite injection technology could be evaluated as a possible contingent action in the event that groundwater contamination occurs in the future. Again, if apatite technology were to be evaluated as a possible contingent action, there may be a need to evaluate other possible groundwater treatment technologies for use as possible contingent actions.

Deliverables

1. Interim Deliverable – A brief memorandum will be prepared summarizing the results of the evaluation of potential applicability of apatite/phosphate-based treatment technologies to the waste materials and site conditions associated with OU-1. This interim deliverable will also include a recommendation relative to identification and evaluation of potential additional remedial alternatives that may be based on apatite treatment technologies.
2. SFS revisions – Assuming that the evaluation of apatite treatment technologies only entails evaluation of the potential applicability of this technology and does not result in development of new/additional remedial alternatives, the following revisions to the SFS report are anticipated:
 - a. Section 4 – Technology Screening to include evaluation of apatite treatment technology
 - i. Section 4.2 – identify apatite treatment technology as an additional technology to be evaluated in the SFS
 1. Note: May need to identify other possible groundwater treatment technologies and expand the SFS to include evaluation of these
 - ii. Section 4.3 – include a description of apatite injection technology
 - iii. Section 4.4 – either:
 1. Identify apatite treatment technology as a technology that was screened out; or
 2. Evaluate the implementability of apatite treatment technology for either:
 - a. Chemical stabilization of radionuclides in the waste mass (subject to determining that information exists on possible use of apatite in this manner); or
 - b. For use as possible contingent action in the event that groundwater contamination occurs in the future.
 - iv. Figure 24 – Add evaluation of the technical implementability of apatite treatment technology(ies) to this figure.
 - v. Figure 27 – Add evaluation of the anticipated effectiveness, implementability and cost of apatite treatment technology(ies).

In the event that apatite treatment technology is found to be potentially applicable based on the site and waste conditions, there may be a need to develop one or more additional remedial alternatives for detailed analysis in the Supplemental SFS report. Such an effort is not included with the scope of the evaluation of apatite treatment technology addressed by this Scope of Work.

Clarifications by EPA

EMSI requests clarification from EPA regarding EPA's expectations relative to potential application of apatite and/or phosphate treatment technologies at the site. To date, review of the technical literature and information from other sites has only resulted in identification of application of apatite/phosphate technology for treatment of groundwater. EMSI has not identified any technical literature discussing potential application of apatite and/or phosphate solutions as methods of treating waste/source materials. Therefore, EMSI requests any information EPA can provide regarding known or potential applications of such technologies for direct treatment of waste.

EMSI wastes to discuss with EPA the possible role of apatite or other groundwater treatment technologies relative to preparation of a Supplemental SFS report. These include the following:

1. How the SFS should address the lack of/minimal nature of impacts to groundwater relative to any evaluation of potential apatite treatment technology for groundwater given that:
 - a. Groundwater was not identified as a media of concern in the FS or SFS and therefore general response actions and remedial technologies for groundwater were not identified or evaluated in either document.
 - b. Groundwater treatment was not identified as being necessary (see above language from the ROD).
2. Evaluation of apatite treatment as a possible contingent technology
 - a. Apatite technology could be evaluated as a technology for possible use as a contingent action in the event that significant groundwater impacts arise in the future.
 - b. Would there be a need to evaluate other possible technologies that could possibly be used as contingent technologies in the event of future groundwater impacts?
3. Evaluation of apatite treatment (or other contingent groundwater technologies) would be limited to identification and screening of technologies for possible future contingent applications. This would not result in development or evaluation of a remedial alternative(s) for groundwater treatment.
4. Overall evaluation of apatite treatment of groundwater is inconsistent with the FS guidance. Specifically, as groundwater was not identified as a media of concern, the FS and SFS did not identify, screen or evaluate technologies for groundwater treatment.
5. Obtain additional information that EPA may be aware of on prior applications and experience with apatite treatment technology.

Schedule

It is anticipated that collecting available information on potential use of apatite/phosphate-based treatment technologies, screening of the potential implementability of such technologies to the waste materials and site conditions at OU-1, evaluating the potential effectiveness, implementability, and cost of such potential applications, if appropriate, and preparing a summary memorandum will take approximately six weeks after receipt of EPA clarifications to the items identified above.

Preparation of a Supplemental SFS report that includes the results of the evaluations of apatite/phosphate-based treatment technologies will be performed once EPA comments on the interim deliverable are received and in conjunction with revisions to the existing SFS report required to address the results of the various other additional tasks EPA has requested.

References

Engineering Management Support, Inc. (EMSI), 2011, Supplemental Feasibility Study, Radiologically-Impacted Material Excavation Alternative Analysis, West Lake Landfill Operable Unit-1, December 16.

EMSI, 2006, Feasibility Study, West Lake Landfill Operable Unit-1, May 8.

U.S. Environmental Protection Agency (EPA), 2008, Record of Decision – West Lake Landfill Site, Bridgeton Missouri, Operable Unit 1, May.

EPA, 1988, Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA – Interim Final, EPA 540/G-89/004, OSWER Directive 9355-3-01, October.

Technical References – Apatite Treatment Technology

Bostick, William D., undated, Abstract – The Use of Apatite for Chemical Stabilization of Subsurface Contaminants: Phosphate-Induced Metals Stabilization (PIMS) for Remediation of Radionuclides and Heavy Metal Contaminants at DOE Sites, emp-13.

Department of Ecology, State of Washington, 2010, Focus on Blocking Strontium – All About Apatite, Publication 06-05-008, July.

Department of Ecology, State of Washington, undated, Cleaning Hanford's Groundwater, Ecology Publication #08-05-001.

Department of Ecology, State of Washington and United States Environmental Protection Agency, 2007, Considerations for Cleanup of the Hanford 200 Area National Priorities List Site, December.

Department of Ecology, State of Washington, undated, Apatite – Blocking strontium from reaching the Columbia River, <http://www.ecy.wa.gov/programs/nwp/apatite.htm>

Wellman, Dawn, M., Fruchter, John, S., Vermeul, Vince, R., Richards, Emily, Jansik, Danielle, P., and Edge, Ellen, 2011, Evaluation of the Efficacy of Polyphosphate Remediation Technology: Direct and Indirect Remediation of Uranium Under Alkaline Conditions in *Technology and Innovation*, Vol. 13, pp. 151-164, Cognizant Comm. Corp.

Wellman, D. M., Pierce, E.M., Bacon, D. H., Oostrom, M., Gunderson, K. M., Webb, S. M., Bovaird, C. C., Cordova, E. A., Clayton, E. T., Parker, K., E., Ermi, R. M., Baum, S.R., Vermeul, V. R., and Fruchter, J. S., 2008, 300 Area Treatability Test: Laboratory Development of Polyphosphate Remediation Technology for In Situ Treatment of Uranium Contamination in the Vadose Zone and Capillary Fringe, Pacific Northwest National Laboratory publication PNNL-17818, September.

Wellman, D. M., Vermeul, V. R., Fruchter, J. S. and Williams, M. D., 2008, Challenges Associated with Apatite Remediation of Uranium in the 300 Area Aquifer, Pacific Northwest National Laboratory publication PNNL-17480, April.

Wellman, Dawn, M., Pierce, Eric, M., and Valenta, Michelle, M., 2007, Efficacy of soluble sodium tripolyphosphate amendments for in-situ immobilization of uranium, *Environmental Chemistry*, 2007, 4, 293-300, CSIRO Publishing.

Wellman, Dawn, M., Glovack, Julia, N., Parker, Kent, Richards, Emily, L. and Pierce, Eric, M., 2008, Sequestration and retention of uranium(VI) in the presence of hydroxylapatite under dynamic geochemical conditions, *Environmental Chemistry*, 2008, 5,40-50, CSIRO Publishing.

Work Plan

Additional Present Value Cost Estimates

Introduction

The present value (also referred to as present worth) cost estimates presented in the Supplemental Feasibility Study [SFS] (EMSI, 2011) were based on the Office of Management and Budget (OMB) real discount rate of 2.3% (as of 12-2011). EPA's October 12, 2012 letter indicated that the National Remedy Review Board has recommended that present value calculations be performed using a 7% discount rate.

For reference, EPA guidance directs evaluation of alternatives using a 7% discount rate (NCP, OSWER Directives 9355.3-20 and 9355.0-75) for non-federally financed projects. EPA guidance allows for use of lower or higher discount rate than 7% for the FS present value analysis. EPA guidance also requires evaluation of alternatives for federally funded projects to be based on real discount rates found in OMB Circular A-94 (2.3% for 2011).

Approach

Pursuant to EPA's request, present value cost estimate calculations will be prepared based on both the current OMB rate and a 7% discount rate. Accordingly, the cost estimates presented in the SFS will be updated to include both discount rates as will any additional estimates to be developed in conjunction with additional evaluations requested by EPA for a Supplemental SFS. The results of these additional estimates will be compared to previous estimates to determine the sensitivity of the cost estimates to the discount rate.

A narrative will also be prepared to explain why both rates are being used for the SFS. The narrative will present a discussion addressing why use of the OMB rate is more appropriate for the SFS based on the following factors:

1. Remedial action for West Lake Landfill OU-1 will be federally-funded (DOE) in part;
2. Fiscally-constrained approaches were identified to address possible Federal (Superfund) funding of the remedial actions; and
3. The likelihood of being able to obtain a 7% pre-tax return over the anticipated near-term period of remedy construction is remote.

Deliverables

Interim Deliverable – A brief memorandum will be prepared to present the present value cost estimates for the ROD-selected remedy and the two “complete rad removal” alternatives presented in the SFS

based on the OMB rate included in the SFS and a 7% discount rate. Development of cost estimates to be performed in conjunction with the other additional evaluations requested by EPA will also include both the OMB rate and a 7% discount rate.

SFS revisions – the following revisions to the SFS report are anticipated as part of this additional evaluation:

1. Section 6.1.7.3 – Revise text to address use of both 7% discount rate and OMB rate
2. Sections 6.2.1.7, 6.2.2.7, and 6.2.3.7 – Revise the discussion of the present value costs of the alternatives to include both present values based on 7% and OMB discount rates
3. Section 7.2.5 – Revise discussion of present values to include values based on both 7% and OMB discount rates
4. Appendix K – Include present value calculations based on both 7% and OMB discount rates

Please note that at the time the Supplemental SFS is prepared, the present value cost estimates will be updated to reflect the then-current OMB rate, which may differ from the rate used in the SFS or in preparation of the various interim deliverables documenting the results of the additional evaluations requested by EPA.

Clarifications by EPA

No additional clarification is being requested from EPA at this time.

Schedule

Preparation of additional present value cost estimates for the ROD-selected remedy and the two “complete rad removal” alternatives and preparation of a brief summary memorandum of the results of these additional evaluations will take approximately three weeks. Preparation of present value costs associated with the other additional evaluations requested by EPA will be completed in accordance with the schedules for completion of these other evaluations.

Preparation of present value costs using both discount rates for the other evaluations requested by EPA will be performed once EPA comments on the interim deliverables, and in conjunction with preparation of a Supplemental SFS.

References

Engineering Management Support, Inc. (EMSI), 2011, Supplemental Feasibility Study, Radiologically-Impacted Material Excavation Alternative Analysis, West Lake Landfill Operable Unit-1, December 16.

United States Environmental Protection Agency (EPA), 2000, A Guide to Developing and Documenting Cost Estimates During the Feasibility Study, EPA 540-R-00-002/OSWER Directive 9355.0-75, July.

EPA, 1993, Memorandum: Revisions to OMB Circular A-94 on Guidelines and Discount Rates for Benefit-Cost Analysis, OSWER Directive No. 9355.3-20, June 25.

Work Plan

Partial Excavation Alternative

Introduction

In an October 12, 2012 letter to the West Lake Landfill Operable Unit-1 (OU-1) Respondents ("EPA's Letter"), EPA directed Respondents to update the analysis of the alternative presented in the May 2006 Feasibility Study for OU-1 (EMSI, 2006) ("FS") involving excavation of material with higher levels of radioactivity ("FS Partial Excavation Alternative"). EPA's Letter requested that the updated analysis be at a level of detail comparable to the alternatives already analyzed in the Supplemental Feasibility Study (SFS) for West Lake Landfill Operable Unit-1 (EMSI, 2011). To implement this directive, Respondents therefore need to use the same criteria that were used to define the FS Partial Excavation Alternative to define the scope of the Partial Excavation with Off-Site Disposal Alternative and Partial Excavation with On-Site Alternative requested in EPA's Letter ("Partial Excavation Alternatives") -- that is, the presence of radionuclides with activity levels greater than 1,000 picocuries per gram pCi/g or the presence of downhole gamma readings greater than 500,000 counts per minute (cpm).

Approach

The detailed evaluation of the Partial Excavation Alternatives will be prepared in a similar manner and level of detail as was used for the evaluation of the ROD-selected remedy and the two "complete rad removal alternatives", as presented in the SFS. Specifically, excavation and final grading plans will be prepared for the Partial Excavation Alternatives based on the criteria listed above. The volumes of overburden and radiologically-impacted material (RIM) that would be excavated under these alternatives will be calculated. The thickness of cover material necessary to provide protection against gamma radiation and radon emissions under the Partial Excavation Alternatives will be calculated using the same approach as was used in the SFS for evaluation of the cover thickness for the ROD-selected remedy. A construction schedule and cost estimate will be developed for the Partial Excavation Alternatives at a similar level of detail and based on similar assumptions and factors as were used to develop the schedules and cost estimates presented in the SFS. Calculations of the residual long-term risk that may remain under the Partial Excavation Alternatives as well as calculations of potential short-term risks to workers and the public will be performed in a manner similar to that used in the SFS.

Deliverables

Interim Deliverable --A technical memorandum will be prepared that presents the following information relative to the Partial Excavation Alternatives:

1. Definition of and basis for the overall scope of the Partial Excavation Alternatives;

2. Excavation and final grading plans;
3. Cover thickness calculations;
4. Short-term and long-term risk calculations;
5. Construction schedule (for both fiscally and non-fiscally constrained approaches);
6. Construction cost estimates (for both fiscally and non-fiscally constrained approaches); and
7. Present value analysis (for both fiscally and non-fiscally constrained approaches).

SFS Revisions – The existing SFS text, tables and appendices will be amended to include the results of Partial Excavation Alternatives development and evaluation. Subject to EPA comments on the Interim Deliverable, the following specific revisions to the December 2011 SFS report are anticipated:

1. New SFS Sections would include:
 - a. Section 5.4 describing the Partial Excavation Alternatives
 - b. 6.2.4 presenting the detailed evaluation of the Partial Excavation Alternative with Off-Site Disposal
 - c. Section 6.2.5 presenting the detailed evaluation of the Partial Excavation Alternative with On-Site Disposal
 - d. New Appendix or New Sub-Appendices to Appendix B to present the evaluation of the volumes of RIM to be excavated under the Partial Excavation Alternatives
2. Sections of the SFS that would need to be amended include:
 - a. Section 7 – Comparative Analysis
 - b. Appendix F – Calculate the required cover thickness associated with the Partial Excavation Alternatives
 - c. Appendix H – Estimate the potential risks to the community and workers based on the volumes of RIM and overburden material to be excavated and revised construction schedules under the Partial Excavation Alternatives
 - d. Appendix I – Prepare additional estimates of Greenhouse Gas Emissions associated with the Partial Excavation Alternatives
 - e. Appendix J – Prepare additional construction schedules for the Partial Excavation Alternatives
 - f. Appendix J – Prepare additional estimates of the construction costs (both fiscally constrained and not-fiscally constrained) for the Partial Excavation Alternatives

Schedule

Upon receipt of EPA approval of this Work Plan, it is anticipated that evaluation of the Partial Excavation Alternatives and preparation of an Interim Technical Memorandum will require approximately four months.

Preparation of a Supplemental SFS report that includes the results of the evaluations of the Partial Excavation Alternatives will be performed once EPA comments on the interim deliverable are received

and in conjunction with revisions to the existing SFS report required to address the results of the various other additional tasks EPA has requested.

References

Engineering Management Support, Inc. (EMSI), 2011, Supplemental Feasibility Study, Radiologically-Impacted Material Excavation Alternative Analysis, West Lake Landfill Operable Unit-1, December 16.

EMSI, 2006, Feasibility Study, West Lake Landfill Operable Unit-1, May 8.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 7

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OCT 12 2012

Steven Miller, Esq.
U.S. Department of Energy
Office of General Counsel
GC-51, Forrestal 6A-113
Washington, D.C. 20585

Re: *In the Matter of Cotter Corporation (NSL), and Laidlaw Waste Systems (Bridgeton), Inc. and Rock Road Industries, Inc. and the U.S. Department of Energy*
Administrative Order on Consent, EPA Docket No. VII-93-F-0005

Dear Mr. Miller:

This is to confirm that as Respondents to the above-captioned Administrative Order on Consent (Consent Order) for a Remedial Investigation/Feasibility Study (RI/FS), you have agreed to perform additional work pursuant to Paragraph 51 of the Consent Order. Your agreement was previously conveyed to me in our conference call on June 14, 2012. The U.S. Environmental Protection Agency National Remedy Review Board recommended this work be performed for Operable Unit 1 of the West Lake Landfill Superfund Site after participating with Region 7 in an early consultation on Region 7's selection of the remedy and the Supplemental Feasibility Study which Respondents prepared. The NRRB recommendations that Region 7 seeks to have implemented at this time include more detailed evaluations of (i) the partial excavation alternative; (ii) alternative landfill cap designs; and (iii) treatment technologies.

Through technical discussions between EPA Remedial Project Manager Dan Gravatt and your consultant, Paul Rosasco, Respondents agreed to perform an additional round of groundwater sampling. This work has now been undertaken and results of the sampling are pending. Respondents also agreed to perform the following:

1. Alternative Excavation Volume – Respondents shall revise the excavation volume to exclude the deep radiological detections in borings WL-210 and WL-235, which the NRRB believes are unreliable.
2. Partial Excavation Alternative – Respondents shall define the parameters to be used to define the extent and configuration of the waste materials to be included in the Partial Excavation with Off-Site Disposal and Partial Excavation with On-Site Disposal, and then update the analysis of this alternative presented in the RI/FS at a level of detail comparable to the alternatives already analyzed in the SFS.
3. Apatite Treatment Technologies – Respondents shall evaluate potential applications of apatite and/or phosphate solutions for possible treatment of waste materials and/or groundwater at a level of detail comparable to the treatment technologies already analyzed in the SFS.



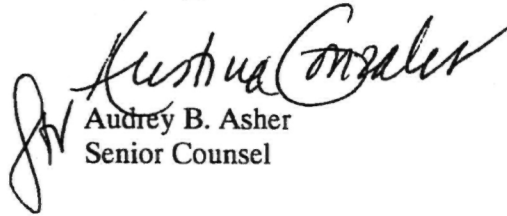
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4. Respondents shall recalculate costs for all alternatives, using a seven percent Discount Rate for the Present Value calculations.
5. Alternative Landfill Cap Designs – Respondents shall evaluate potential alternative landfill cover designs including but not limited to an Evapotranspiration (ET) cover.
6. Fate and Transport Modeling – Respondents shall submit a geochemical model to assess the potential mobility and potential leachability of the radionuclides, followed by (if necessary) an unsaturated zone transport model, followed by a site-specific groundwater flow and transport model (if the prior two models indicate that a potentially measurable impact to groundwater may occur), followed by (if necessary) a regional groundwater flow and transport model to address possible transport to the river; and if necessary, a surface water flow and transport model to address possible transport within the river.

Respondents shall provide a work plan and a schedule for the work described above for the EPA review which will be mutually acceptable to the EPA and Respondents. Respondents shall document the work performed in an amendment to the SFS report.

The Consent Order remains in effect until terminated by the EPA. Unless any Respondent indicates otherwise in writing to me, this letter accurately reflects the agreement by all parties to the Consent Order to perform additional work.

Sincerely,


Audrey B. Asher
Senior Counsel

Enclosure: List of letter recipients

cc: Sarah Himmelhoch, DOJ-EES
Dan Gravatt, SUPR
Shawn Muenks, MDNR

Recipients to Westlake Landfill Letter

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Administrative Order on Consent, EPA Docket No. VII-93-F-0005*

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